

Claims

[c1] 1. A multifunctional battery charger, capable of charging both lithium battery and nickel–metal hydride battery, comprising:

a slot, for receiving a battery to be charged, wherein said battery is a lithium battery or a nickel–metal hydride battery;

a microcontroller, comprising an identifying module and a charging module, wherein said identifying module is adapted for identifying a specification of said battery in said slot; and

a pulse width modulator, for charging said battery in said slot, said pulse width modulator and said slot connected to said microcontroller, wherein said charging module of said microcontroller is adapted for controlling said pulse width modulator for charging said battery.

[c2] 2. The multifunctional battery charger according to claim 1, wherein said pulse width modulator is connected to a power suppler.

[c3] 3. The multifunctional battery charger according to claim 1, wherein said identifying module comprises a maximum protected voltage circuit (MPV).

[c4] 4. The multifunctional battery charger according to claim 1, wherein said identifying module comprises an application specific integrated circuit (ASIC).

[c5] 5. A method of charging a battery using a multifunctional battery charger, comprising:

- (a) inserting a battery into a slot of said multifunctional battery charger;
- (b) using a pulse width modulator to charge said battery in said slot;
- (c) using an identifying module of a microcontroller to check whether a charged voltage has reached a preset charging level, wherein if the charged voltage has not reached to the preset charging level, the method proceeds to step (d);
- (d) using said identifying module of said microcontroller to check whether a charged current has changed, wherein if the charged current has not changed, the method proceeds to step (e);
- (e) using said identifying module of said microcontroller to check whether a negative delta voltage ($-\Delta V$) has occurred, wherein if the negative delta voltage ($-\Delta V$) has occurred, the method proceeds to step (f); and
- (f) using a nickel–metal hydride battery charging module to control said pulse width modulator for charging said battery.

- [c6] 6. The method of charging a battery using a multifunctional battery charger according to claim 5, wherein if the charged voltage has reached to the preset charging level, the method proceeds to step (g), wherein a lithium battery charging module is used to control said pulse width modulator for charging said battery.
- [c7] 7. The method of charging a battery using a multifunctional battery charger according to claim 5, wherein if the charged current has changed, the method proceeds to step (g), wherein a lithium battery charging module is used to control said pulse width modulator for charging said battery.